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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/079,999	02/19/2002	Yoichi Mizuno	16869S-043800US	7054

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EXAMINER

SHAH, SAUMIL R

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/079,999

Applicant(s)

MIZUNO ET AL.

Examiner

Saumil Shah

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 15-34 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1, 15-17, 19-24, 26-31, 33 and 34 is/are rejected.
7) ☒ Claim(s) 18, 25 and 32 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The correction made in the amendment filed on 03/11/2004 has been noted and the objection to the specification has been withdrawn.

Claim Rejections - 35 USC § 112

2. The changes made to claim 1 in the amendment filed on 03/11/2004 has been noted and the rejection to the claim has been withdrawn.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 19, 20, 26, 27, 33 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

- a. According to claim 19, a computer connected to the backup apparatus stores data of a logical unit via a controller (say controller A). This takes place after the control of this logical unit has been transferred to another controller (say controller B) from controller A.

But, according to the specifications, after controller B takes over control of the logical unit, data is copied to the backup apparatus by the computer via controller B itself and *not controller A* as is claimed. This is described on pages

19-22 of the specification. Particularly note lines 10-14 on page 22 where the backup is done through the controller 11n (controller B as per the naming above). Also note page 20, lines 27-28 and page 21, lines 1-4 where the control has been transferred to controller 11n (controller B) and the computer does backup.

Note claim 20 is dependent on claim 19.

b. A similar explanation holds for claim 26 and its dependent claim 27.

c. A similar explanation holds for claim 33 and its dependent claim 34.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 16, 19, 20, 23, 26, 27, 30, 33 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. With regard to claims 16, 23 and 30, the phrase "first logical units to said second controller" is unclear. It is suggested to add words such as "previously designated" to make the meaning clear.

b. With regard to claim 19, 26 and 33, the phrase "first logical units to said second controller" is unclear. It is suggested to add words such as "previously designated" to make the meaning clear.

c. With regard to claim 20, 27 and 34, the phrase "first logical units to said second controller" is unclear. It is suggested to add words such as "previously designated" to make the meaning clear.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 16, 21, 23, 28, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idleman et al (US Patent No. 6,154,850) in view of DeKoning et al (US Patent No. 6,073,218).

a. With regard to claim 1, Idleman et al disclose a system for storing data, comprising:

at least one computer (note figure 3, 10); and

a disk array apparatus to be used by said at least one computer, said disk array apparatus including:

a plurality of disks (note figure 3, 42a, b, c),

a first controller (note figure 10, 41a), and

a second controller (note figure 10, figure 41b),

wherein said first controller controls a plurality of first logical units in said plurality of disks and manages first configuration information of said plurality of first logical units (note column 6, lines 30-34),

wherein said second controller controls a plurality of second logical units in said plurality of disks and manages second configuration information of said plurality of second logical units (note column 6, lines 32-36), and

wherein said first controller takes over control of one of said plurality of first logical units from said first controller to said second controller by rewriting said first configuration information associated with said one of said plurality of first logical units (note column 6, lines 45-53 where the state machine is coded in each controller. Further note, column 7, lines 55-67 and column 8, lines 1-5 where one of the controllers fail and it passes into the release state where it releases all its tape arrays and the other controller takes over control of these tape arrays by switching the tape arrays over).

Idleman et al fail to disclose wherein said first controller has a first exclusive cache and said second controller has a second exclusive cache, and wherein said first controller and said second controller are coupled to said plurality of disks.

DeKoning et al teach wherein said first controller has a first exclusive cache and said second controller has a second exclusive cache, and wherein said first controller and said second controller are coupled to said plurality of disks (note figure 1, 116.1 and 116.2 are the exclusive memories for the controllers)

Hence, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have exclusive caches for each of the controllers as taught by DeKoning et al in the system of Idleman et al since this would have negated the need for having access arbitration for a shared cache memory and

thus reducing the complexity and increasing the speed of the cache access process.

b. With regard to claim 16, the combined system of Idleman et al/ DeKoning et al teach each of the features described for claim 1 above. DeKoning et al further teach a system wherein after said first controller write data of said one of said plurality of first logical units, stored in said first exclusive cache, onto said plurality of disks, said first controller takes over control of said one of said plurality of first logical units to said second controller (note column 18, lines 37-44 where the cache flush takes place after which the LUN could be granted exclusive access to some other controller. Here exclusive access has been considered to be the same as taking control of the LUN in the context of the invention).

c. With regard to claim 21, the combined system of Idleman et al/ DeKoning et al teach each of the features as is described for claim 1 above.

d. With regard to claim 23, the combined system of Idleman et al/ DeKoning et al teach each of the features as is described for claim 16 above.

e. With regard to claim 28, the combined system of Idleman et al/ DeKoning et al teach each of the features as is described for claim 1 above.

f. With regard to claim 30, the combined system of Idleman et al/ DeKoning et al teach each of the features as is described for claim 16 above.

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9. Claims 15, 17, 22, 24, 29, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idleman et al (US Patent No. 6,154,850) in view of DeKoning et al (US Patent No. 6,073,218) and in further view of Otterness et al (US Patent No. 6,654,831).

a. With regard to claim 15, the combined system of Idleman et al/ DeKoning et al disclose everything as is mentioned in claim 1 above.

The combined system of Idleman et al/ DeKoning et al fail to disclose a management apparatus being coupled with said at least one computer and said disk array apparatus, wherein said management apparatus designates a first logical unit number and said second controller to said disk array apparatus, wherein said first logical unit number corresponds to said one of said plurality of first logical unit number corresponds to said one of said plurality of first logical units, and wherein said first controller takes over control of said one of said plurality of first logical units designated by said management apparatus to said second controller designated by said management apparatus.

Otterness et al teach a management apparatus being coupled with said at least one computer and said disk array apparatus, wherein said management apparatus designates a first logical unit number and said second controller to said disk array apparatus, wherein said first logical unit number corresponds to said one of said plurality of first logical unit number corresponds to said one of said plurality of first logical units (note column 5, lines 32-39 where the master controller designates the data to the slave controllers), and wherein said first

controller takes over control of said one of said plurality of first logical units designated by said management apparatus to said second controller designated by said management apparatus (note column 8, lines 38-40 where a controller takes over control from a failed controller).

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a management apparatus which designates a logical unit number to a controller as taught by Otterness et al to the system of Idleman et al/ DeKoning et al since this would have a special manager to manage the various resource allocations and so increasing the efficiency of the system.

b. With regard to claim 17, the combined system of Idleman et al/ DeKoning et al disclose everything as is mentioned in claim 16 above.

The combined system of Idleman et al/ DeKoning et al fail to disclose a management apparatus being coupled with said at least one computer and said disk array apparatus, wherein said first controller write said data of said one of said plurality of first logical units, stored in said first exclusive cache, onto said plurality of disks in response to a write instruction from said management apparatus.

Otterness et al teach a management apparatus being coupled with said at least one computer and said disk array apparatus, wherein said first controller write said data of said one of said plurality of first logical units, stored in said first exclusive cache, onto said plurality of disks in response to a write instruction from

said management apparatus (note column 5, lines 35-39 where the master controller gives a write command to the slave controller and the data is written into the disks from the cache).

Hence it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a management apparatus which gives a write instruction to copy data from the cache into the disks as taught by Otterness et al in the combined system of Idleman et al/ DeKoning et al since this would have flushed the cache before a change of controllers takes place and thus reducing the chance of the data in the cache becoming invalid.

c. With regard to claim 22, the combined system of Idleman et al/ DeKoning et al/ Otterness et al teach each of the features as is described for claim 15 above.

d. With regard to claim 24, the combined system of Idleman et al/ DeKoning et al/ Otterness et al teach each of the features as is described for claim 17 above.

e. With regard to claim 29, the combined system of Idleman et al/ DeKoning et al/ Otterness et al teach each of the features as is described for claim 15 above.

f. With regard to claim 31, the combined system of Idleman et al/ DeKoning et al/ Otterness et al teach each of the features as is described for claim 17 above.

Allowable Subject Matter

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10. Claims 18, 25 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion


11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saumil Shah whose telephone number is 703-305-8786. The examiner can normally be reached on 9:00 AM to 5:30 PM M-F.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 703-305-3821. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Saumil Shah
Patent Examiner
AU: 2186

June 10, 2004



BEHZAD JAMES PEIKARI
PRIMARY EXAMINER